

CLAIMS

1. Dry water resistant coaxial cable consisting of: a metal core conductor element, a dielectric element around the core conductor based on three layers, the first layer being applied onto the conductor as a uniformly thick film based on low density polyethylene mixed with a vinyl or acrylic adhesive, the second layer being based on an expanded polyethylene mix consisting of low density polyethylene or mixture of low, medium, and high density polyethylenes and a swelling agent based on azodicarbonamide, p-toluene sulphonyl hydrazide, or 5-phenyl tetrazol, and optionally a reinforcement layer of the same characteristics as the first one; characterized because it has a second external conductor element formed by a tape made of an aluminum, or copper alloy or combined with others elements and surrounding said conductor, consisting of a water penetration protective element keeping it dry and based on one or several swellable fibers or tapes formed by polyester threads or other swellable fibers; and the protective cover based on low, medium, or high density polyethylene or a combination of them.
2. The dry coaxial cable according to claim 1, characterized because the core conductor is copper

plated aluminum wire, with a uniform circular cross section of 3.15 ± 0.03 mm diameter.

3. The dry coaxial cable according to claim 1, characterized because the adhesive component is chosen between ethylene acrylate acid or ethylene vinyl acid permitting a better adherence and water resistance between the core conductor and the dielectric element.
4. The dry coaxial cable according to claim 1, characterized because the second polyethylene film applied onto the core conductor, shows a better watertightness to the swellable dielectric, improves its superficial appearance and offers a 13.0 ± 0.10 mm diameter.
5. The dry coaxial cable according to claim 1, characterized because the external conductor formed by a tape made of aluminum or copper alloy or mixture of them is formed in a cylindrical pipe and can be longitudinally welded, extruded or the edges can be overlapped and it has a thickness of 0.34 mm and the diameter on the pipe is $13.70 \text{ mm} \pm 0.10$ mm.
6. The dry coaxial cable according to claim 1, characterized because the water penetration protective element consists of swellable tapes placed helically, annularly or longitudinally.

7. The dry coaxial cable according to claim 6, characterized because the moisture protection elements have an absorption speed of ≥ 15 ml/g per minute and their absorption capacity is over 30 ml/g.
- 5 8. The dry coaxial cable according to claim 1, characterized because the external cover is preferably made of medium density black polyethylene and has a diameter on cover of $15.5 \text{ mm} \pm 0.10 \text{ mm}$ with a $0.67 \text{ mm} \pm 0.02 \text{ mm}$ thickness.
- 10 9. A manufacturing method for the dry coaxial cable according to claims 1 to 8, consisting of the following steps: preparing a core conductor feeding reel welding its end onto another reel so that the manufacturing can be continuous, passing the core conductor onto a first polyethylene film application through extrusion, the polymer being chosen among polyethylene, polyester or polypropylene mixed with an ethylene acrylate acid adhesive; extruding, based on high, low or medium density polyethylene mix with a swellable agent such as 15 azodicarbonamide, p-toluene sulphonyl hydrazide or 5-phenyl tetrazol with high pressure inert gas injection to improve cellular expansion, optionally a second film having the same characteristics as the first one through co-extrusion; cooling at room temperature; the core obtained is wound and a pipe shaped external
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conductor made of aluminum, copper or a combination of them is applied, said pipe can be formed through welding, or overlapping of the edges or through extrusion; application of helical, annular or longitudinal water penetration protection element; and application of the protective cover through extrusion of low, medium or high density polyethylene or a combination of them.

10 10. The manufacturing method for the dry coaxial cable according to claim 10, characterized because the core can be manufactured through triple co-extrusion in three extruders, one for the first film, another for the main insulation and the other for the second film, which are connected to an extrusion head.

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